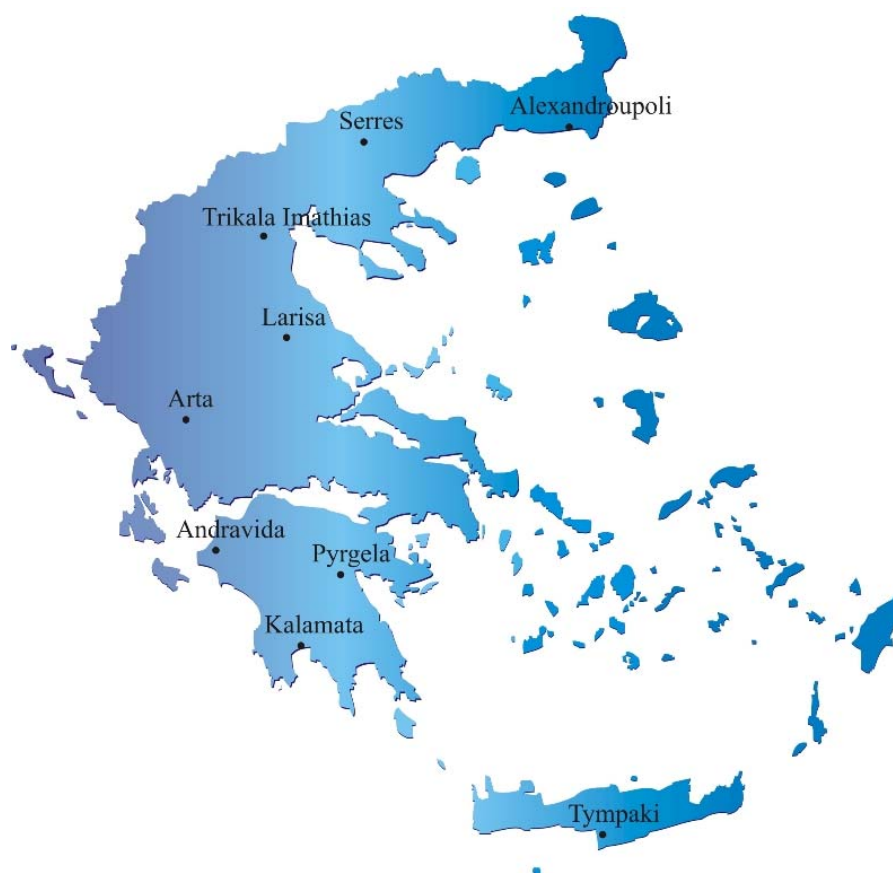


# AGROMETEOROLOGICAL BULLETIN

*July 2010*  
*2nd 10-day period*

- Temperature
- Relative Humidity
- Soil Temperature
- Sunshine Duration
- Precipitation
- Evaporation
- Growing Degrees
- Reference Evapotranspiration
- Accumulated Rainfall from the beginning of wet period
- Accumulated Reference Evapotranspiration
- Number of dry days



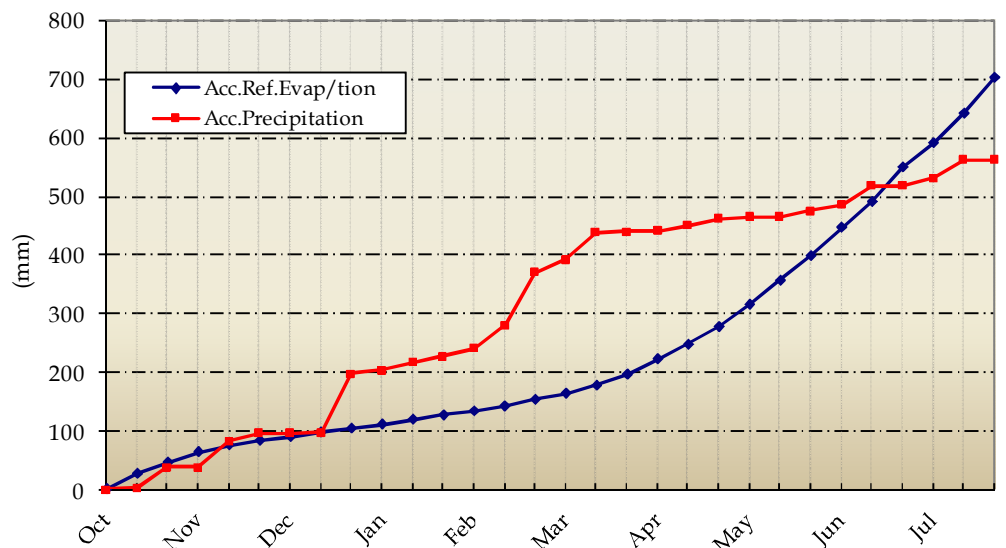
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*Web addresses of HNMS*  
[www.hnms.gr](http://www.hnms.gr)  
[www.emy.gov.gr](http://www.emy.gov.gr)  
[www.meteo.gov.gr](http://www.meteo.gov.gr)  
[www.meteohellas.gr](http://www.meteohellas.gr)

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	28.0	32.2	31.0	33.0	34.2	34.0	34.0	33.8	34.8	33.4	32.8	32.3	30.5
	Min	17.8	20.0	19.2	22.2	22.6	23.0	22.4	21.4	20.6	24.4	21.4	20.8	17.5
Relative Humidity	Max	82	82	81	79	77	75	75	70	73	70	76	72	-
	Min	47	49	51	48	41	34	26	30	29	44	40	33	-
Soil Temperature at 10 cm	06 UTC	22.4	24.5	25.2	26.4	27.0	27.0	27.0	27.6	27.0	27.6	26.2	28.3	24.2
	12 UTC	26.8	28.2	28.6	28.6	30.0	29.6	29.6	29.4	29.6	29.4	29.0	32.2	28.8
Sunshine Duration		12.6	11.2	12.7	13.2	11.3	13.0	13.6	13.3	13.4	11.4	12.6	12.2	11.2
Precipitation														5.1
Evaporation		8.7	3.9	8.4	7.7	8.8	9.2	9.4	9.8	13.1	9.6	88.6	103.9	98.7
Growing Degrees	5	17.9	21.1	20.1	22.6	23.4	23.5	23.2	22.6	22.7	23.9	221.0	215.2	190.1
	10	12.9	16.1	15.1	17.6	18.4	18.5	18.2	17.6	17.7	18.9	171.0	165.2	140.1

2nd 10-day period (11-20/07/2010)	Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	61.3	62.0
Precipitation - Reference Evapotranspiration	-61.3	-62.0
Number of Rainy Days	0.0	0.0
Number of Dry Days	12.0	10.0

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

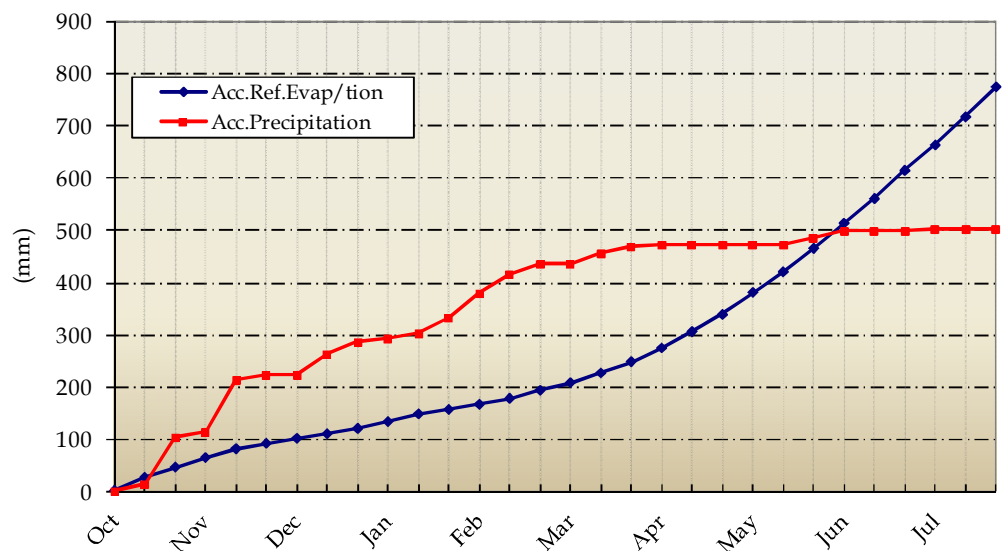


Andravida

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.4	30.2	29.8	31.4	32.4	34.6	32.8	34.0	33.8	33.4	32.2	30.5	30.4
	Min	18.6	18.6	18.8	19.0	21.0	21.8	20.4	19.8	21.2	21.4	20.1	19.5	18.1
Relative Humidity	Max	90	91	94	90	91	93	91	87	90	88	90	93	-
	Min	40	45	47	47	49	39	40	32	32	35	41	43	-
Soil Temperature at 10 cm	06 UTC	27.8	27.8	27.8	28.0	28.8	29.8	29.6	29.0	30.0	30.0	28.9	28.4	27.1
	12 UTC	35.2	35.2	35.0	35.4	36.4	37.8	36.4	37.8	37.8	37.4	36.4	35.3	31.8
Sunshine Duration		12.8	12.6	11.9	12.4	12.4	12.2	12.4	12.4	11.5	12.4	12.3	12.9	12.3
Precipitation														0.8
Evaporation		12.1	6.2	9.6	6.0	10.3	10.0	8.2	8.5	9.8	9.3	90.0	94.6	77.4
Growing Degrees	5	19.0	19.4	19.3	20.2	21.7	23.2	21.6	21.9	22.5	22.4	211.2	200.0	192.4
	10	14.0	14.4	14.3	15.2	16.7	18.2	16.6	16.9	17.5	17.4	161.2	150.0	142.4

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.4	56.6	55.3
Precipitation - Reference Evapotranspiration	-57.4	-56.6	-54.5
Number of Rainy Days	0.0	0.0	0.1
Number of Dry Days	27.0	26.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

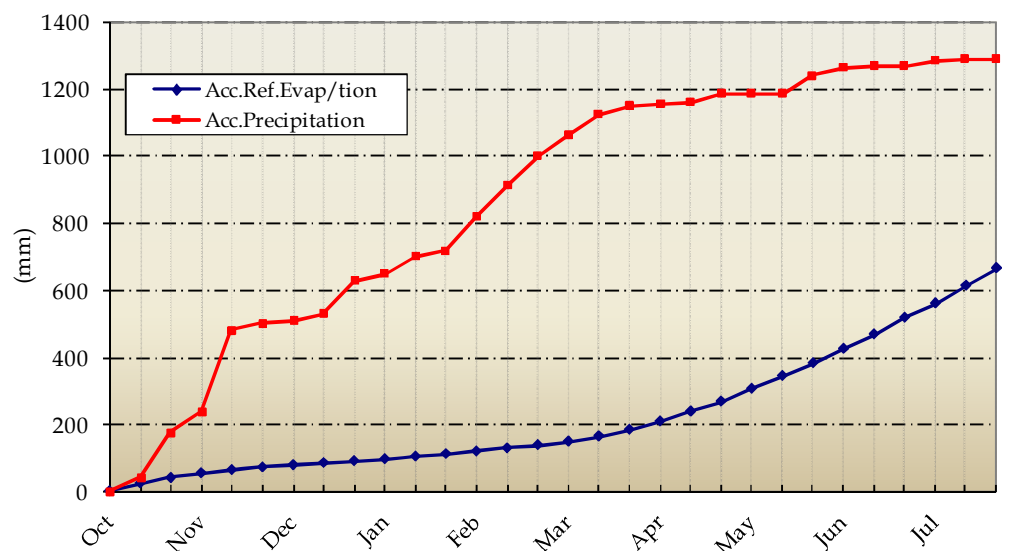




2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.2	32.0	31.8	34.0	35.6	38.0	36.2	35.2	35.2	35.2	34.5	33.0	31.4
	Min	18.8	17.4	17.8	19.0	19.4	21.0	20.4	20.4	19.6	19.0	19.3	17.7	17.4
Relative Humidity	Max	95	94	97	97	96	96	91	95	84	82	93	80	-
	Min	34	40	44	33	31	26	29	30	29	29	32	40	-
Soil Temperature at 10 cm	06 UTC	27.0	27.2	27.4	27.0	28.2	28.8	29.0	29.0	28.4	27.2	27.9	27.6	26.7
	12 UTC	29.2	29.6	30.0	30.0	30.4	31.0	31.0	31.0	30.0	29.4	30.2	29.8	31.9
Sunshine Duration		12.8	12.8	12.8	12.8	12.8	11.7	10.6	8.4	6.4	12.8	11.4	12.5	11.1
Precipitation								0.2	0.1			0.3		3.7
Evaporation		7.5	7.0	7.2	7.2	6.8	9.4	7.4	7.5	3.9	7.0	70.9	70.8	-
Growing Degrees	5	20.5	19.7	19.8	21.5	22.5	24.5	23.3	22.8	22.4	22.1	219.1	203.7	193.9
	10	15.5	14.7	14.8	16.5	17.5	19.5	18.3	17.8	17.4	17.1	169.1	153.7	143.9

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	51.9	54.0	50.7
Precipitation - Reference Evapotranspiration	-51.6	-54.0	-47.0
Number of Rainy Days	2.0	0.0	0.6
Number of Dry Days	12.0	15.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

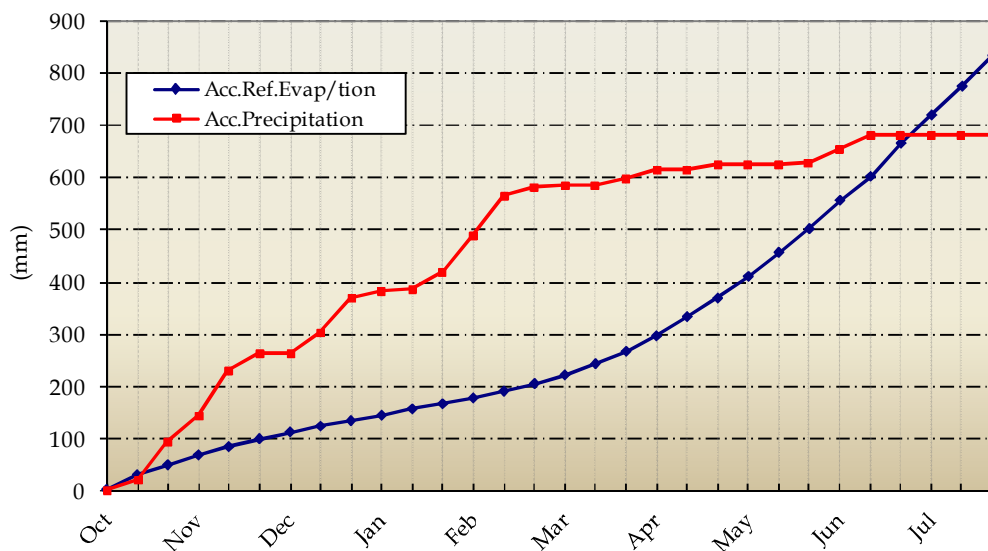


Kalamata

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	29.0	31.6	31.4	34.6	33.8	31.2	33.6	31.0	32.0	32.6	32.1	31.6	31.2
	Min	16.6	20.2	18.2	22.0	21.6	20.0	20.8	19.0	19.0	20.0	19.7	18.7	17.8
Relative Humidity	Max	85	85	87	77	84	87	86	88	87	83	85	85	-
	Min	50	31	38	34	38	52	38	51	41	39	41	36	-
Soil Temperature at 10 cm	06 UTC	24.6	25.0	25.2	25.6	25.8	26.4	25.8	26.2	26.4	26.2	25.7	24.9	25.6
	12 UTC	27.4	27.8	28.0	28.4	29.0	28.8	28.4	28.8	29.0	28.4	28.4	26.9	30.0
Sunshine Duration		10.4	12.6	12.7	11.2	12.5	8.7	10.3	12.5	9.2	11.7	11.2	12.4	11.5
Precipitation										0.0		0.0		3.4
Evaporation		6.0	9.2	10.4	7.0	8.0	7.2	5.8	8.2	7.0	7.0	75.8	91.0	87.7
Growing Degrees	5	17.8	20.9	19.8	23.3	22.7	20.6	22.2	20.0	20.5	21.3	209.1	201.7	195.0
	10	12.8	15.9	14.8	18.3	17.7	15.6	17.2	15.0	15.5	16.3	159.1	151.7	145.0

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	59.2	57.8	57.1
Precipitation - Reference Evapotranspiration	-59.2	-57.8	-53.7
Number of Rainy Days	0.0	0.0	0.4
Number of Dry Days	27.0	25.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

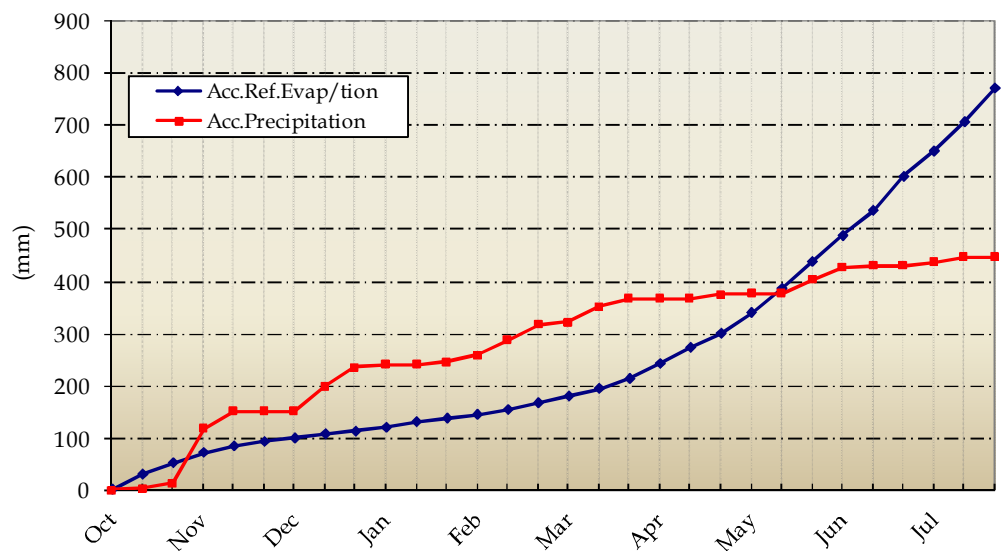


Larisa

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.6	35.6	36.0	37.0	38.2	34.8	34.2	35.2	34.0	33.6	35.2	34.8	33.3
	Min	19.2	20.0	20.4	22.2	21.4	26.0	21.0	22.0	21.0	21.6	21.5	19.5	17.9
Relative Humidity	Max	74	76	68	70	65	62	64	67	77	64	69	72	-
	Min	29	24	26	27	21	32	27	29	23	26	26	22	-
Soil Temperature at 10 cm	06 UTC	26.6	27.0	27.6	28.4	28.4	28.6	28.8	28.8	28.8	28.6	28.2	26.9	26.6
	12 UTC	30.0	30.6	31.0	32.0	33.2	32.4	32.0	32.2	31.6	31.8	31.7	29.3	29.2
Sunshine Duration		11.6	12.5	12.8	12.5	11.5	12.1	11.8	11.7	9.2	10.4	11.6	12.6	11.0
Precipitation														9.9
Evaporation		11.5	11.2	9.0	7.8	16.8	10.4	8.3	12.0	11.5	9.4	107.9	107.4	96.3
Growing Degrees	5	21.4	22.8	23.2	24.6	24.8	25.4	22.6	23.6	22.5	22.6	233.5	221.5	205.9
	10	16.4	17.8	18.2	19.6	19.8	20.4	17.6	18.6	17.5	17.6	183.5	171.5	155.9

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	64.9	67.8	62.2
Precipitation - Reference Evapotranspiration	-64.9	-67.8	-52.3
Number of Rainy Days	0.0	0.0	1.2
Number of Dry Days	12.0	13.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



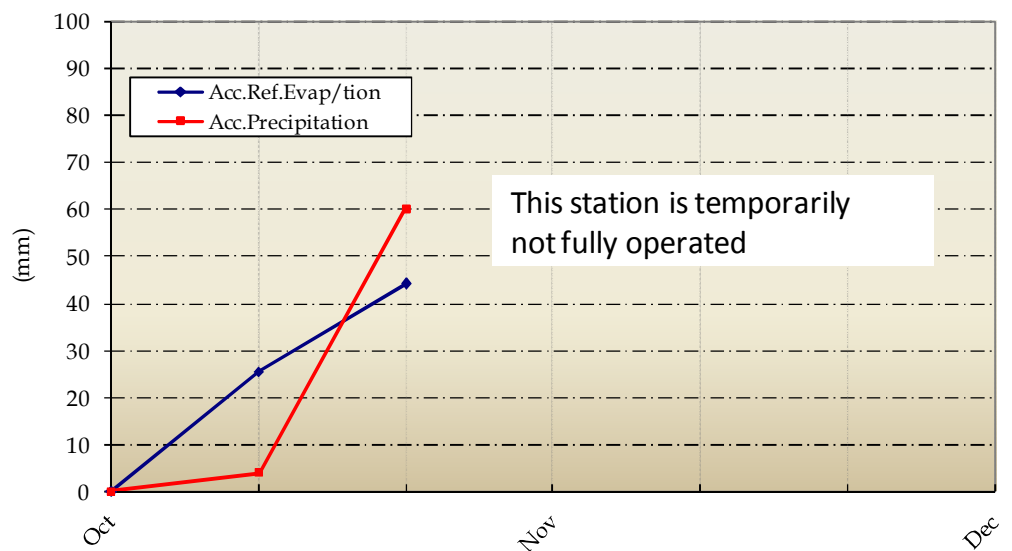


Pyrgela

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	-	-	-	-	-	-	-	-	-	-	-	36.3	33.6
	Min	17.4	17.4	19.0	20.0	20.0	21.0	21.8	16.8	-	-	19.2	17.0	16.4
Relative Humidity	Max	73	53	50	44	51	45	53	-	-	-	53	66	-
	Min	24	22	26	22	20	31	29	-	-	-	25	26	-
Soil Temperature at 10 cm	06 UTC	28.4	28.4	29.4	30.0	29.4	31.0	30.6	29.0	-	-	29.5	27.2	26.5
	12 UTC	36.4	38.4	38.4	38.8	39.4	38.4	38.0	38.2	-	-	38.2	36.3	35.2
Sunshine Duration		11.2	11.3	11.6	11.2	11.5	11.2	12.3	-	-	-	11.5	12.3	10.9
Precipitation												-		2.1
Evaporation		7.0	6.4	7.0	7.4	8.6	6.8	5.8	-	-	-	-	75.7	75.2
Growing Degrees	5	-	-	-	-	-	-	-	-	-	-	-	216.5	200.1
	10	-	-	-	-	-	-	-	-	-	-	-	166.5	150.1

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	-	56.7	53.6
Precipitation - Reference Evapotranspiration	-	-56.7	-51.5
Number of Rainy Days	-	0.0	0.7
Number of Dry Days	-	14.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

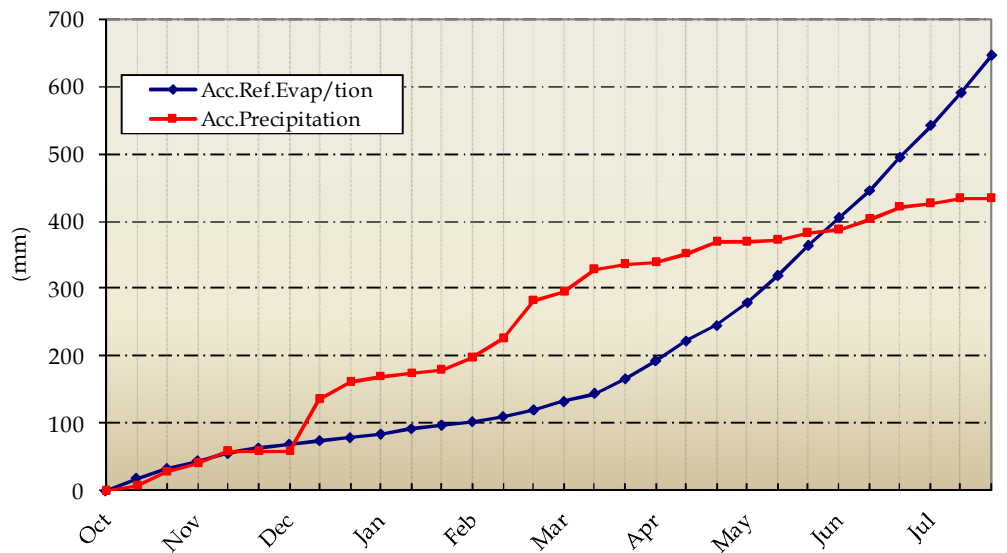


Series

2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.8	35.8	37.2	38.0	38.2	36.6	37.0	36.8	36.0	35.8	36.5	33.8	32.6
	Min	19.6	19.2	20.4	20.4	21.6	21.6	22.6	21.6	21.6	20.0	20.9	20.4	18.6
Relative Humidity	Max	80	72	66	67	63	74	65	68	68	66	69	66	-
	Min	27	29	27	23	24	26	29	29	27	26	27	34	-
Soil Temperature at 10 cm	06 UTC	26.0	26.8	27.4	28.2	29.0	29.4	29.8	29.2	29.2	29.2	28.4	25.4	25.7
	12 UTC	27.4	27.0	29.4	29.8	30.4	30.6	31.6	31.4	31.2	31.4	30.0	28.0	29.2
Sunshine Duration		12.3	11.0	12.5	10.3	12.0	11.4	11.7	11.1	9.2	6.4	10.8	10.9	10.5
Precipitation									0.7			0.7	5.1	5.2
Evaporation		7.9	8.0	8.1	8.5	9.2	8.8	9.0	9.2	8.4	6.0	83.1	59.3	73.2
Growing Degrees	5	21.7	22.5	23.8	24.2	24.9	24.1	24.8	24.2	23.8	22.9	236.9	221.3	197.9
	10	16.7	17.5	18.8	19.2	19.9	19.1	19.8	19.2	18.8	17.9	186.9	171.3	149.8

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	55.6	56.4	50.4
Precipitation - Reference Evapotranspiration	-54.9	-51.3	-45.2
Number of Rainy Days	1.0	1.0	1.6
Number of Dry Days	7.0	0.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration

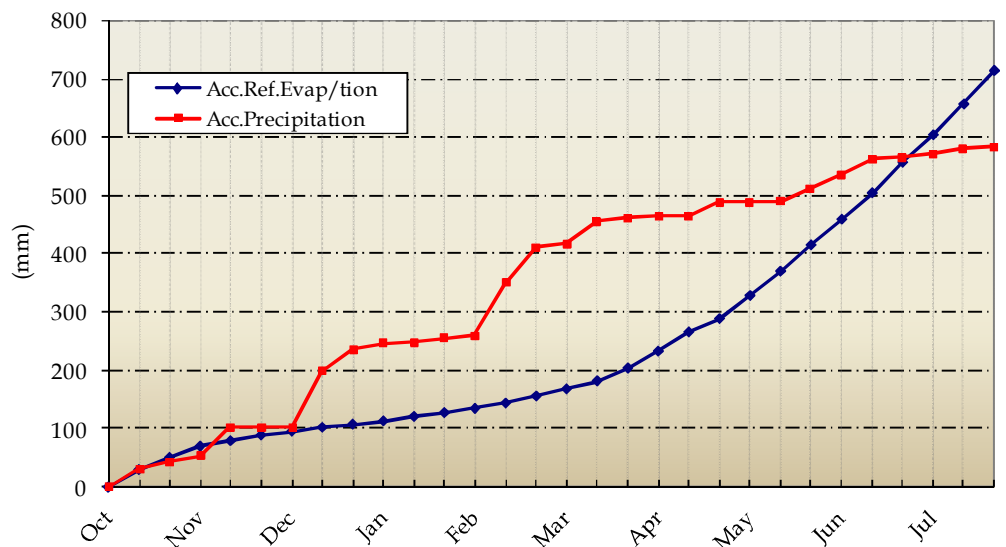




2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	33.4	34.6	35.8	37.2	37.4	36.2	34.0	35.4	34.2	34.0	35.2	33.3	31.4
	Min	18.6	20.4	20.6	21.6	21.2	22.4	22.6	21.8	22.2	21.2	21.3	20.1	17.9
Relative Humidity	Max	91	92	95	92	88	84	95	90	79	89	90	81	-
	Min	40	37	38	31	31	39	45	38	38	42	38	36	-
Soil Temperature at 10 cm	06 UTC	26.6	27.2	27.4	28.4	28.8	29.2	29.4	28.6	28.4	28.0	28.2	27.6	25.5
	12 UTC	30.2	31.0	31.4	32.2	32.4	32.4	32.4	33.2	31.0	31.4	31.8	31.8	27.1
Sunshine Duration		12.0	12.4	12.6	12.9	13.0	11.8	12.3	11.2	10.7	11.9	12.1	11.7	10.3
Precipitation										1.8		1.8	6.3	2.1
Evaporation		3.1	5.4	5.1	5.6	6.6	6.0	6.0	4.2	5.9	5.1	53.0	62.1	67.1
Growing Degrees	5	21.0	22.5	23.2	24.4	24.3	24.3	23.3	23.6	23.2	22.6	232.4	217.0	196.2
	10	16.0	17.5	18.2	19.4	19.3	19.3	18.3	18.6	18.2	17.6	182.4	167.0	146.2

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	57.5	60.9	50.9
Precipitation - Reference Evapotranspiration	-55.7	-54.6	-48.8
Number of Rainy Days	1.0	1.0	0.9
Number of Dry Days	10.0	4.0	-

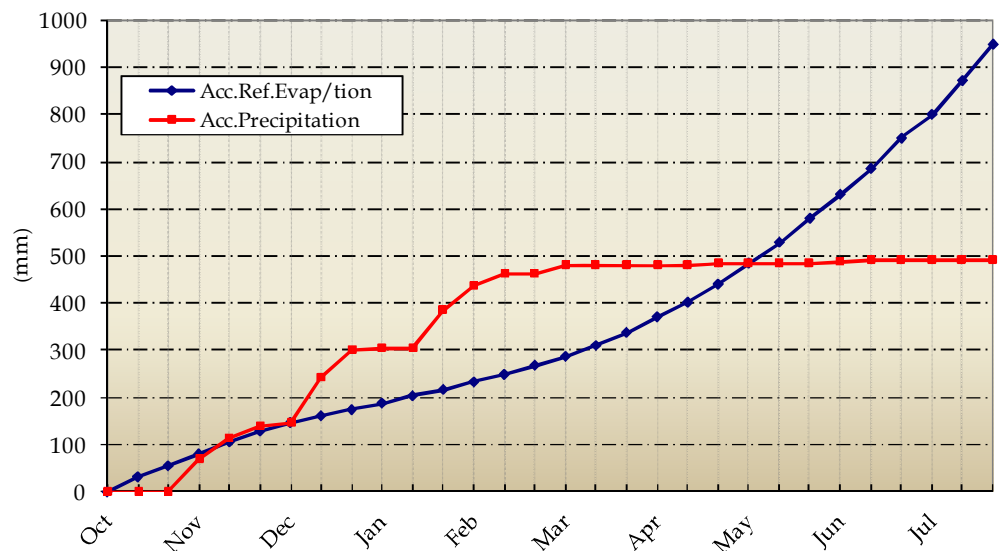
Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration



2nd 10-day period (11-20/07/2010)		11	12	13	14	15	16	17	18	19	20	Mean Value or Sum	Previous Year Value	Past Years Mean Value
Temperature	Max	32.6	32.8	30.0	36.4	37.4	33.6	33.4	34.0	34.4	34.2	33.9	33.3	32.0
	Min	21.6	21.0	21.6	21.6	24.0	23.8	23.0	21.2	21.6	22.4	22.2	20.4	20.5
Relative Humidity	Max	65	73	99	91	61	76	79	65	77	74	76	70	-
	Min	39	34	51	24	26	41	39	32	30	30	35	29	-
Soil Temperature at 10 cm	06 UTC	30.4	30.4	30.8	30.8	31.8	32.2	31.6	30.6	30.6	30.6	31.0	30.8	31.2
	12 UTC	35.0	36.2	36.8	36.6	37.6	36.2	35.8	35.6	35.2	35.4	36.0	36.9	35.7
Sunshine Duration		12.5	12.6	12.3	12.6	12.4	12.2	11.5	12.5	11.7	12.0	12.2	12.2	12.4
Precipitation														
Evaporation		12.0	11.9	7.9	13.6	15.5	12.8	14.9	15.2	16.7	15.1	135.6	119.5	121.3
Growing Degrees	5	22.1	21.9	20.8	24.0	25.7	23.7	23.2	22.6	23.0	23.3	230.3	218.3	211.0
	10	17.1	16.9	15.8	19.0	20.7	18.7	18.2	17.6	18.0	18.3	180.3	168.3	161.4

2nd 10-day period (11-20/07/2010)		Previous Year Value	Past Years Mean Value
Reference Evapotranspiration	77.1	67.1	67.8
Precipitation - Reference Evapotranspiration	-77.1	-67.1	-67.8
Number of Rainy Days	0.0	0.0	0.0
Number of Dry Days	45.0	77.0	-

Diagram of Accumulated Precipitation and Accumulated Reference Evapotranspiration





◆ **List of Symbols and Abbreviations**

**Reference Evapotranspiration ETo (mm):**

Calculated by the FAO Penman-Montieth equation

$$ET_0 = \frac{0.408 * \Delta * (R_n - G) + \gamma * \frac{900}{T + 273} * u_2 * (e_s - e_a)}{\Delta + \gamma * (1 + 0.34 * u_2)}$$

using 10-day step.

R<sub>n</sub> is estimated from sunshine measurements and G assumed to be zero.

**Growing Degrees:** Degrees with mean temperature exceeding the base of 5 or 10 °C.

**Number of Rainy Days:** Number of days with precipitation of at least 0.1 mm.

**Number of Dry Days:** Number of dry days recorded since the last rainy day.

**Measurements Units**

- ◆ Temperature : °C
- ◆ Relative Humidity : %
- ◆ Soil Temperature : °C
- ◆ Sunshine Duration : Hours
- ◆ Precipitation : mm
- ◆ Evaporation (Pan) : mm
- ◆ Growing Degrees : °C

**UTC (Universal Time coordinates) in Greece**

- ◆ Winter : Time(UTC) = Local time - 2
- ◆ Summer : Time(UTC) = Local time - 3

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